REMARKS

The present Amendment amends claims 1-3, 5, 12, 15, 16, 18-20, and 22 and leaves claims 4, 6-11, 13, 14, 17, 21, 23, and 24 unchanged. Therefore, the present application has pending claims 1-24.

35 U.S.C. §102 Rejections

Claims 1-8, 12-14, 18, and 20-22 stand rejected under 35 USC 102(e) as being anticipated by U.S. Patent No. 6,253,240 to Axberg, et al. ("Axberg"). This rejection is traversed for the following reasons. Applicants submit that the features of the present invention, as now more clearly recited in claims 1-8, 12-14, 18, and 20-22, are not taught or suggested by Axberg, whether taken individually or in combination with any of the other references of record. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Amendments were made to the claims so as to more clearly describe the features of the present invention. Specifically, amendments were made to the claims to more clearly describe that the present invention is directed to a data storage system and a control method of a data storage system as recited, for example, in independent claims 1, 5, 12, 18, and 20.

Claims 1-4

The present invention, as recited in claim 1, and as similarly recited in claim 2, provides a control method of a data storage system. In the system, multiple external storage systems are connected to a first network, and each of the storage systems is arranged separately. The control method includes the steps of generating an interrupt by an external storage system to a management server and issuing an

exclusive control command by the management server to the external storage system. The management server receives configuration information from the external storage system in response to the exclusive control command. The method also includes a step of storing the configuration information received by the management server in a database at the management server. The prior art does not disclose all these features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record, particularly Axberg, whether taken individually or in combination with any of the other references of record.

Axberg discloses a method for producing a coherent view of a storage network by a storage network manager using data storage device configuration information obtained from data storage devices. However, there is no teaching or suggestion in Axberg of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

Axberg's method includes a distributed storage management program that manages a network. The network includes multiple data storage devices attached to multiple host computer systems. The management program includes a separate agent in each host, and a central manager. The agents gather data and communicate with the manager across a communications path that is independent of the storage network. The manager collates the data from different agents to produce a coherent view of the network. Preferably, each local agent actively builds an internal topological view of the network as seen by its host and collects data such as

error events, which it stores in internal data structures. The manager is able to resolve gaps in the information of each agent from information provided by other agents. Preferably the manager presents the network as a collection of objects of different classes in an object-oriented class library. This collection is graphically displayed in a logical and understandable manner to a user on a display device.

The control method of the present invention, as recited in claim 1, includes a step of generating an interrupt by an external storage system to a management server. Axberg does not disclose this feature. To support the assertion that Axberg discloses this feature, the Examiner alleges that it is inherent within network interfaces for a communication from the storage disks to the central manager, by way of the local agent, to generate a communication interrupt. Furthermore, the Examiner asserts that a network daemon, which is part of the local agent, generates an interrupt. Both the alleged and cited features of Axberg are quite different from the present invention.

First, as alleged by the Examiner, the communication in Axberg between the storage disks and the local agent results in a communication interrupt being generated from the storage disks to the local agent. The Examiner suggests that the communication interrupt generated by the storage disks is inherently provided to the central manager, by way of the local agent. Applicants submit that an interrupt provided to a local agent, as alleged by the Examiner, is not necessarily further provided to the central manager. Furthermore, this alleged inherent feature differs from the present invention in that in the present invention, an interrupt generated by the external storage system is provided to the management server. If a

communication interrupt is generated by the storage disks in Axberg to the local agent, as alleged by the Examiner, then if an interrupt is further provided to the central manager, it would necessarily be provided by the local agent to the central manager — not by an external storage to a management server, in the manner claimed.

Next, the Examiner asserts that a network daemon, which is part of the local agent, generates an interrupt. This feature is more fully described in Axberg in column 21, lines 39-60. As described, a network daemon handles live synchronous events (interrupts) from hardware. There is no teaching or suggestion in Axberg, particularly in the cited text, of generating an interrupt by an external storage system to a management server, as claimed. Therefore, Axberg does not disclose this feature.

Another feature of the present invention, as recited in claim 1 and as similarly recited in claim 2, includes issuing an exclusive control command by the management server to the external storage system. As described on page 5, lines 22-23 of the present application, an exclusive control command temporarily limits access to all multiple disk subsystems. In this way, as described on page 12, lines 17-21, the management server becomes the only control server that enables the configuration setting of the whole system. Axberg does not disclose this feature. To support the assertion that Axberg discloses this feature, the Examiner cites: column 14, lines 29-40; column 16, line 43 to column [1]8, line 10; column 19, lines 11-20; and Fig. 10. However, the commands cited by the Examiner are not exclusive control commands. Furthermore, the commands cited by the Examiner are issued

from the manager to the local agent — not by the management server to the external storage system, as claimed (*see, e.g.*, column 14, line 29, stating that "the manager polls the local agent periodically" and column 16, line 43, stating that "This command calls the local agent"). Therefore, Axberg does not disclose this feature.

Yet another feature of the present invention, as recited in claim 1 and a similarly recited in claim 2, includes a step of receiving by the management server configuration information from the external storage system in response to the exclusive control command. Axberg does not disclose this feature. To support the assertion that Axberg discloses this feature, the Examiner cites: column 14, lines 29-40; column 19, lines 43-65; and column 19, lines 47-51. As previously discussed, Axberg does not teach or suggest providing an exclusive control command, as claimed. It necessarily follows that Axberg does not teach or suggest receiving by the management server, configuration information from the external storage system in response to an exclusive control command.

Therefore, Axberg fails to teach or suggest "generating an interrupt by an external storage system to a management server" as recited in claim 1.

Furthermore, Axberg fails to teach or suggest "issuing an exclusive control command by said management server to said external storage system" as recited in claim 1, and as similarly recited in claim 2.

Even further, Axberg fails to teach or suggest "receiving by said management server, configuration information from said external storage system in response to said command" as recited in claim 1, and as similarly recited in claim 2.

Applicants submit that claims 3 and 4 are dependent on claim 2, and therefore, are patentable for at least the same reasons discussed previously regarding independent claim 2.

Claims 5-8

The present invention, as recited in claim 5, provides a control method of a data storage system where multiple computers and multiple external storage systems are connected to a network. The method includes the steps of logging on to a management server to request access permission and issuing an exclusive control command by the management server to the external storage systems. The method also includes the steps of receiving by the management server from the external storage systems in response to the exclusive control command and storing configuration information received by the management server in a database at the management server. The prior art does not disclose all these features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record, particularly Axberg, whether taken individually or in combination with any of the other references of record.

As previously discussed, Axberg discloses a method for producing a coherent view of a storage network by a storage network manager using data storage device configuration information obtained from data storage devices. However, there is no teaching or suggestion in Axberg of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

One feature of the present invention, as recited in claim 5, includes logging on to a management server to request access permission. Axberg does not disclose this feature. To support the assertion that Axberg discloses this feature, the Examiner states, "logging on is inherent in the servers that are mentioned in the cited paragraphs." However, to establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. (See MPEP §2112(IV)). The step of logging on to a management server to request access permission is not a step that necessarily occurs. Access may be granted with or without logging on or with or without requesting permission for access. Therefore, Axberg does not disclose the claimed feature.

Another feature of the present invention, as recited in claim 5, includes issuing an exclusive control command by the management server to the external storage systems. As described on page 5, lines 22-23 of the present application, an exclusive control command temporarily limits access to all multiple disk subsystems. In this way, as described on page 12, lines 17-21, the management server becomes the only control server that enables the configuration setting of the whole system. As previously discussed with regard to the rejection of claim 1, Axberg does not teach this feature. The commands cited by the Examiner are not exclusive control commands and they are issued from the manager to the local agent — not by the management server to the external storage systems, as claimed (*see, e.g.*, column

14, line 29, stating that "the manager polls the local agent periodically" and column 16, line 43, stating that "This command calls the local agent"). Therefore, Axberg does not disclose this feature.

Yet another feature of the present invention, as recited in claim 5, includes a step of receiving by the management server configuration information from the external storage systems in response to the exclusive control command. Axberg does not disclose this feature. As previously discussed, Axberg does not teach or suggest providing an exclusive control command, as claimed. It necessarily follows that Axberg does not teach or suggest receiving by the management server, configuration information from the external storage systems in response to an exclusive control command.

Therefore, Axberg fails to teach or suggest "logging on to a management server to request access permission" as recited in claim 5.

Furthermore, Axberg fails to teach or suggest "issuing an exclusive control command by said management server to said external storage systems" as recited in claim 5.

Even further, Axberg fails to teach or suggest "receiving by said management server, configuration information from said external storage systems in response to said command" as recited in claim 5.

Applicants submit that claims 6-8 are dependent on claim 5, and therefore, are patentable for at least the same reasons discussed previously regarding independent claim 5.

Claims 12-14

The present invention, as recited in claim 12, provides a control method of a data storage system where multiple computers and multiple external storage systems are connected to a network. The method includes the steps of issuing an exclusive control command by a management server to multiple external systems and receiving by the management server configuration information from the external storage systems in response to the exclusive control command. The method also includes the steps of activating application programs of the multiple computers based on the exclusive control command issued by the management server and receiving by the management server host configuration information from the multiple computers. Another step of the method includes storing in a database at the management server the received configuration information and host logical configuration information. The prior art does not disclose all these features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record, particularly Axberg, whether taken individually or in combination with any of the other references of record.

As previously discussed, Axberg discloses a method for producing a coherent view of a storage network by a storage network manager using data storage device configuration information obtained from data storage devices. However, there is no teaching or suggestion in Axberg of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

The present invention, as recited in claim 12, provides a step of issuing an exclusive control command by a management server to multiple external storage systems. As described on page 5, lines 22-23 of the present application, an exclusive control command temporarily limits access to all multiple disk subsystems. In this way, as described on page 12, lines 17-21, the management server becomes the only control server that enables the configuration setting of the whole system. As previously discussed with regard to the rejection of claim 1, Axberg does not teach this feature. The commands cited by the Examiner are not exclusive control commands and they are issued from the manager to the local agent — not by the management server to the external storage systems, as claimed (*see, e.g.*, column 14, line 29, stating that "the manager polls the local agent periodically" and column 16, line 43, stating that "This command calls the local agent"). Therefore, Axberg does not disclose this feature.

Another feature of the present invention, as recited in claim 12, includes a step of receiving by the management server configuration information from the external storage systems in response to the exclusive control command. Axberg does not disclose this feature. As previously discussed, Axberg does not teach or suggest providing an exclusive control command, as claimed. It necessarily follows that Axberg does not teach or suggest receiving by the management server, configuration information from the external storage systems in response to an exclusive control command.

Yet another feature of the present invention, as recited in claim 12, includes a step of activating application programs of the multiple computers based on the

exclusive control command issued by the management server. Axberg does not disclose this feature. To support the assertion that Axberg teaches this feature, the Examiner cites column 19, lines 31-42, which provides that a local library is activated upon receiving a call from the central manager. As previously discussed, Axberg does not teach or suggest providing an exclusive control command, as claimed. It necessarily follows that Axberg does not teach or suggest activating application programs of the multiple computers based on the exclusive control command issued by the management server. Furthermore, activating the local library based upon the receipt of "a call" from the central manager, as disclosed in Axberg is quite different from activating application program based on an exclusive control command from the management server, as in the present invention.

Therefore, Axberg fails to teach or suggest "issuing an exclusive control command by said management server to multiple external storage systems" as recited in claim 12.

Furthermore, Axberg fails to teach or suggest "receiving by said management server configuration information from said external storage systems in response to said command" as recited in claim 12.

Even further, Axberg fails to teach or suggest "activating application programs of said multiple computers based on said exclusive control command issued by the management server" as recited in claim 12.

Applicants submit that claims 13 and 14 are dependent on claim 12, and therefore, are patentable for at least the same reasons discussed previously regarding independent claim 12.

Claim 18

The present invention, as recited in claim 18, provides a data storage system where multiple external storage systems are connected to a network and each external storage system has an external connection interface that sends information to define or refer to configuration or show performance, and data or post a fault. The data storage system includes a management server part, which is connected to the multiple external storage systems and a configuration information database that accumulates a time for each event and the corresponding event information of the multiple external storage systems via the external connection interface. The prior art does not disclose all these features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record, particularly Axberg, whether taken individually or in combination with any of the other references of record.

As previously discussed, Axberg discloses a method for producing a coherent view of a storage network by a storage network manager using data storage device configuration information obtained from data storage devices. However, there is no teaching or suggestion in Axberg of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

One feature of the present invention, as recited in claim 18, includes a configuration information database that accumulates a time for each event and the corresponding event information of the multiple external storage systems via the external connection interface. Axberg does not disclose this feature. To support the

assertion that Axberg teaches this feature, the Examiner refers to a previous discussion of a file used to store the configuration information at the central manager of Axberg. As described in column 13, lines 45-50, Axberg discloses that collected information can be stored in a file, which the Examiner equates to a database. However, Axberg does not disclose a configuration information database that accumulates a time for each event and the corresponding event information, as claimed. Therefore, Axberg does not disclose this feature.

Therefore, Axberg fails to teach or suggest "a configuration information database that accumulates a time for each event and the corresponding event information of said multiple external storage systems via said external connection interface in point of time series" as recited in claim 18.

Claims 20-22

The present invention, as recited in claim 20, provides a data storage system where multiple computers and multiple external storage systems are connected to a network. In the data storage system, each computer installs an application for acquiring its own host logical configuration information, and each external storage system has an external connection interface that sends event information to define or refer to its configuration, to show performance and data, or to post a fault. The data storage system includes a management server part and a configuration information database. The management server part is connected to the external storage systems and accumulates a time for each event and the corresponding event information of the multiple external storage systems via the external connection interface into the configuration information database. In addition, the

management server part is connected to the computers and accumulates host logical configuration information of the multiple computers via the network, in point of time series. The prior art does not disclose all these features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record, particularly Axberg, whether taken individually or in combination with any of the other references of record.

As previously discussed, Axberg discloses a method for producing a coherent view of a storage network by a storage network manager using data storage device configuration information obtained from data storage devices. However, there is no teaching or suggestion in Axberg of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

One feature of the present invention, as recited in claim 20, includes where the management server part is connected to the external storage systems and accumulates a time for each event and the corresponding event information of the multiple external storage systems via the external connection interface into the configuration information database. Axberg does not disclose this feature. To support the assertion that Axberg discloses this feature, the Examiner refers to Fig. 1. However, as shown in Fig. 1, the management server part (manager 110) is not connected to the external storage systems (disks 120-129) as claimed, but rather is connected to the local agent 111. Furthermore, as asserted by the Examiner, the central manager periodically polls the local agent 112 — not the external storage systems (disks 120-129), as claimed. In this way, Axberg does not disclose where

event information of the external storage systems are accumulated into the configuration information database via the external connection interface of the external storage systems, as claimed. Even further, Axberg does not disclose where the management server accumulates a time for each event and the corresponding event information of the multiple external storage systems. Therefore, Axberg does not disclose this claimed feature.

Another feature of the present invention, as recited in claim 20, includes where the management server part is connected to the computers and accumulates host logical configuration information of the multiple computers via the network, in point in time series. Axberg does not disclose this feature. To support the assertion that Axberg teaches this feature, the Examiner refers to a previous discussion of a file used to store the configuration information at the central manager of Axberg. As described in column 13, lines 45-50, Axberg discloses that collected information can be stored in a file, which the Examiner equates to a database. However, Axberg does not disclose a configuration information database that accumulates event information in point of time series, as claimed. Therefore, Axberg does not disclose this feature.

Therefore, Axberg fails to teach or suggest "wherein the management server part is connected to said external storage systems and accumulates a time for each event and the corresponding event information of said multiple external storage systems via said external connection interface into said configuration information database" as recited in claim 20.

Furthermore, Axberg fails to teach or suggest "wherein the management server part is connected to said computers and accumulates host logical configuration information of said multiple computers via said network, in point of time series" as recited in claim 20.

Applicants submit that claims 21 and 22 are dependent on claim 20, and therefore, are patentable for at least the same reasons discussed previously regarding independent claim 20.

35 U.S.C. §103 Rejections

Claims 9-11 and 19

Claims 9-11 and 19 stand rejected under 35 USC §103(a) as being unpatentable over Axberg in view of U.S. Patent No. 6,671,776 to DeKoning. This rejection is traversed for the following reasons. Applicants submit that the features of the present invention, as now more clearly recited in claims 9-11 and 19, are not taught or suggested by Axberg or DeKoning, whether taken individually or in combination with each other as suggested by the Examienr. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Amendments were made to the claims so as to more clearly describe features of the present invention. Specifically, the claims were amended to more clearly describe that the present invention is directed to a control method of a data storage system as recited, for example, in independent claims 9 and 18.

The present invention, as recited in claim 9, provides a control method for a data storage system. The data storage system includes multiple computers and multiple external storage systems that are connected to a network. The method

includes the steps of logging on to a management server to request access permission and sending configuration information by the management server. The method also includes the steps of instructing the management server to change the configuration information, and issuing an exclusive control command by the management server to multiple external storage systems. In addition, the method includes receiving by the management server the completion of a setting of the configuration information from the external storage systems in response to the command. The method also includes storing in a database at the management serer, a change of the configuration information. The prior art does not disclose all these features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record, particularly Axberg, whether taken individually or in combination with any of the other references of record.

As previously discussed, Axberg discloses a method for producing a coherent view of a storage network by a storage network manager using data storage device configuration information obtained from data storage devices. However, there is no teaching or suggestion in Axberg of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

A feature of the present invention includes logging on to a management server to request access permission. As discussed above with regard to claim 5, Axberg does not disclose this limitation. To support the assertion that Axberg discloses this feature, the Examiner states, "logging on is inherent in the servers that

are mentioned in the cited paragraphs." However, to establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. (See MPEP §2112(IV)). The step of logging on to a management server to request access permission is not a step that necessarily occurs. Access may be granted with or without logging on or with or without requesting permission for access. Therefore, Axberg does not disclose the claimed feature.

Another feature of the present invention, as recited in claims 9 and 19, includes issuing an exclusive control command by the management server to multiple external storage systems. As described on page 5, lines 22-23 of the present application, an exclusive control command temporarily limits access to all multiple disk subsystems. In this way, as described on page 12, lines 17-21, the management server becomes the only control server that enables the configuration setting of the whole system. The Examiner now concedes that Axberg does not disclose this feature (i.e., the Examiner indicated in previous rejections that this feature was taught by Axberg), and relies upon DeKoning for teaching this feature.

Yet another feature of the present invention, as recited in claim 9, includes receiving by the management server the completion of a setting of the configuration information from the external storage systems in response to the external control command. As conceded by the Examiner, Axberg does not disclose this feature.

Therefore, Axberg fails to teach or suggest "logging on to a management server to request access permission" as recited in claim 9.

Furthermore, Axberg fails to teach or suggest "issuing an exclusive control command by said management server to multiple external storage systems" as recited in claim 9 and as similarly recited in claim 19.

Even further, Axberg fails to teach or suggest "receiving by said management server the completion of a setting of said configuration information from said external storage systems in response to the command" as recited in claim 9.

Applicants submit that claim 19 is dependent on claim 18, and therefore, is patentable at least for the same reasons discussed previously regarding independent claim 18.

The above noted deficiencies of Axberg are not supplied by any of the other references, particularly DeKoning. Therefore, combining the teachings of DeKoning with Axberg still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

DeKoning teaches a method and system for determining and displaying the topology of a storage array network having multiple hosts. However, there is no teaching or suggestion in DeKoning of a control method of a data storage system, of the present invention as recited in the claims.

The Dekoning system and method dynamically generates the topology of a storage array network by linking information concerning hosts and clusters along with information about host port adapters. Namely, each host identifies itself to all controllers and provides information in a command that allows the controller to know

which host and cluster, if applicable, is associated with the host port adapter through which the command was issued. In addition, the topology is automatically updated anytime there is a change on the network such as a new device was added or a host port adapter was replaced.

In the present invention, as recited in claim 9, the control method includes a step of logging on to a management server to request access permission. DeKoning does not disclose this feature.

Another step of the present invention, as recited in claim 9 and as similarly recited in claim 19, includes issuing an exclusive control command by the management server to multiple external storage systems. As described on page 5, lines 22-23 of the present application, an exclusive control command temporarily limits access to all multiple disk subsystems. In this way, as described on page 12, lines 17-21, the management server becomes the only control server that enables the configuration setting of the whole system. Although the Examiner concedes that Axberg does not disclose this feature, the Examiner asserts that DeKoning teaches the feature, citing column 7, lines 26-32. However, the cited merely discloses that if a change is made to the topology of the network, such as a host port adapter being replaced or swapped, a command from the host application using the replaced adapter will supply all of the controllers with all of the information they need to modify topology accordingly. This command is quite different from the claimed exclusive control command. Therefore, DeKoning does not disclose this feature.

The present invention, as recited in claim 9, also includes a step of receiving by the management server the completion of a setting of the configuration

information from the external storage systems in response to the exclusive control command. DeKoning does not disclose this feature. First, as discussed above, DeKoning does not disclose the claimed exclusive control command. Therefore, it follows that DeKoning does not disclose receiving the completion of a setting in response to the exclusive control command. Next, to support the assertion that DeKoning teaches this feature, the Examiner relies upon column 7, lines 20-32. However, the cited text does not provide any indication that an action occurs in response to an exclusive control command. As a result, DeKoning does not disclose the claimed feature.

In the Office Action, the Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to use the storage area network discovery method of Axberg in the system disclosed in DeKoning. More specifically, the Examiner asserts that DeKoning shows a system which uses a discovery method, but does not show how such discovery method is implemented, and further asserts that Axberg discloses a general concept of such discovery and how one might perform the discovery. However, the Examiner has not provided any motivation for combining Axberg with DeKoning. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. Although the Examiner has provided a description of the discovery methods used in Axberg and DeKoning, the Examiner has not provided any motivation for combining the teachings of the

references. Furthermore, if both references describe the discovery method as described by the Examiner, then there would be no motivation to combine the two because nothing would be gained from combining the same discovery methods.

Therefore, DeKoning fails to teach or suggest "logging on to a management server to request access permission" as recited in claim 9.

Furthermore, DeKoning fails to teach or suggest "issuing an exclusive control command by said management server to multiple external storage systems" as recited in claim 9 and as similarly recited in claim 19.

Even further, DeKoning fails to teach or suggest "receiving by said management server the completion of a setting of said configuration information from said external storage systems in response to the command" as recited in claim 9.

Applicants submit that claims 10 and 11 are dependent on claim 9, and claim 19 is dependent on claim 18. Therefore, claims 10, 11 and 19 are patentable for at least the same reasons discussed previously regarding the independent claims.

Both Axberg and DeKoning suffer from the same deficiencies relative to the features of the present invention as recited in the claims. Therefore, combining the teachings of Axberg and DeKoning in the manner suggested by the Examiner does not render obvious the features of the present invention as now more clearly recited in claims 9-11 and 19. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 9-11 and 19 are respectfully requested.

Claim 23

Claim 23 stands rejected under 35 USC §103(a) as being unpatentable over Axberg. Applicants submit that claim 23 is dependent on claim 20, and therefore, is

patentable for at least the same reasons as previously discussed with regard to independent claim 20.

Claim 24

Claim 24 stands rejected under 35 USC §103(a) as being unpatentable over Axberg in view of U.S. patent No. 6,598,179 to Chirashnya, et al. ("Chirashnya"). Applicants submit that claim 24 is dependent on claim 20, and therefore, is patentable for at least the same reasons as previously discussed with regard to independent claim 20.

Claim 16

Claim 16 stand rejected under 35 USC §103(a) as being unpatentable over Axberg in view of *VERITAS Volume Manager 3.1 Migration Guide* ("VERITAS"). This rejection is traversed for the following reasons. Applicants submit that the features of the present invention, as now more clearly recited in claim 16, is not taught or suggested by Axberg or VERITAS, whether taken individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Amendments were made to the claims to more clearly describe the features of the present invention. Specifically, the claims were amended to more clearly describe that the present invention is directed to a control method of a data storage system as recited, for example, in independent claim 16.

The present invention, as recited in claim 16, provides a control method of a data storage system. The data storage system includes multiple computers and multiple external storage systems connected to a network. In addition, a

management server is connected via a first network. The method includes a step of making an inquiry by the management server to a computer, the size of a file that application software of the computer uses, and receiving a response in point in time series. The method also includes a step of retrieving by the management server an association between a logical disk unit and the file that was stored in the unit from contents of a configuration information database, and indicating a relationship between the capacity of the logical disk unit and the size of the file in point of time series. The prior art does not disclose all these features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record. More specifically, the features are not taught or suggested by either Axberg or VERITAS, whether taken individually or in combination with each other.

As previously discussed, Axberg discloses a method for producing a coherent view of a storage network by a storage network manager using data storage device configuration information obtained from data storage devices. However, there is no teaching or suggestion in Axberg of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

The present invention, as recited in claim 16, includes a step of inquiring by the management server to a computer, of the size of a file that application software of the computer uses, and receiving in response in point of time series. As conceded by the Examiner, Axberg does not disclose inquiring about the size of a file that application software of the computer uses. Applicants agree that Axberg does not disclose this feature.

Another feature of the present invention, as recited in claim 16, includes a step of retrieving by the management server, an association between a logical disk unit and the file that was stored in the unit from contents of a configuration information database, and indicating a relationship between the capacity of the logical disk unit and the size of the file in point of time series. As conceded by the Examiner, Axberg does not disclose retrieving an association between a logical disk unit and the file that was stored in the unit from contents of a configuration information database, and indicating a relationship between the capacity of the logical disk unit and the size. Applicants agree that Axberg does not disclose this feature.

Therefore, Axberg does not teach or suggest "inquiring by the management server, to a computer of the size of a file that an application software of said computer uses, and receiving a response in point of time series" as recited in claim 16.

Furthermore, Axberg does not teach or suggest "retrieving by said management server, association between a logical disk unit and said file that was stored in the unit from contents of a configuration information database, and indicating a relationship between the capacity of said logical disk unit and the size of said file in point of time series" as recited in claim 16.

The above noted deficiencies of Axberg are not supplied by any of the other references, particularly VERITAS. Therefore, combining the teachings of VERITAS with Axberg still fails to teach or suggest the features of the present invention, as now more clearly recited in the claims.

VERITAS discloses the use of a volume manager graphical user interface (GUI), a storage administrator, and a system administrator manager. However, there is no teaching or suggestion in VERITAS of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

VERITAS discloses how to launch Storage Administrator from the System Administration Manager (SAM) (page 84), how to list disk devices in SAM (page 85), how to list volume groups and disk groups in SAM (page 85), and how to list logical volumes in SAM (page 87). With regard to the latter feature, VERITAS discloses selecting Logical Volumes from the Disks and File Systems SAM to list logical volumes. The Logical Volumes screen lists the LVM logical volumes and the VxVM volumes on the system. The "Type" column, as shown in Fig. 4-3, indicates whether a volume is in use and if so, what it is used for. Fig. 4-3 shows a Logical Volumes screen. As shown, the eight LVM logical volumes in vg00 are used for HFS and VxFS file systems and for swap and dump. The bells VxVM volume in the maroon volume group is used for the VxFS file system and has a directory mounted on it. Furthermore, the vo101 VxVM volume in the rootdg volume group is not currently in use.

The present invention, as recited in claim 15, includes a step of inquiring by the management server to a computer of the size of a file that application software of the computer uses, and receiving a response in point of time series. VERITAS does not disclose this feature. The Examiner concedes that Axberg does not disclose this feature, but asserts that VERITAS discloses the step of inquiring in the manner claimed. To support the assertion that VERITAS teaches the disclosed feature, the

Examiner states that VERITAS "shows searching a file, together with its size and metadata." Notwithstanding the fact that VERITAS does not disclose searching a file, together with its size and metadata as alleged by the Examiner, VERITAS further does not disclose the claimed feature, i.e., inquiring by the management server to a computer of the size of a file that application software of the computer uses, and receiving a response in point of time series. As such, VERITAS does not disclose the claimed feature.

The present invention, as recited in claim 16 also includes a step of retrieving by the management server, association between a logical disk unit and the file that was stored in the unit from contents of a configuration information database, and indicating a relationship between the capacity of the logical disk unit and the size of the file in point of time series. VERITAS does not disclose this feature. To support the assertion that VERITAS discloses this feature, the Examiner cites page 87 and Fig. 4-3 and Fig. 4-12 (it is assumed that the Examiner is referring to Fig. 4-2 because there is no Fig. 4-12 in the reference). More specifically, the Examiner refers to the allocated file size in Fig. 4-3 and the size of the logical volume in Fig. 4-2. However, the cited text and drawings do not disclose an association between a logical disk unit and the file that was stored in the unit or a relationship between the capacity of the logical disk unit and the size of the file in point of time series, as claimed. As such, VERITAS does not disclose the claimed feature.

Therefore, VERITAS does not teach or suggest "inquiring by the management server, to a computer of the size of a file that an application software of said

computer uses, and receiving a response in point of time series" as recited in claim 16.

Furthermore, VERITAS does not teach or suggest "retrieving by said management server, association between a logical disk unit and said file that was stored in the unit from contents of a configuration information database, and indicating a relationship between the capacity of said logical disk unit and the size of said file in point of time series" as recited in claim 16.

Both Axberg and VERITAS suffer from the same deficiencies relative to the features of the present invention as recited in the claims. Therefore, combining the teachings of Axberg and VERITA in the manner suggested by the Examiner does not render obvious the features of the present invention as now more clearly recited in claim 16. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejection of claim 16 are respectfully requested.

Claims 15 and 17

Claims 15 and 17 stand rejected under 35 USC §103(a) as being unpatentable over Axberg in view of VERITAS, further in view of U.S. Patent No. 6,598,179 to Chirashnya, et al. ("Chirashnya"). However, within the rejection, the Examiner also refers to U.S. Patent No. 6,738,973 to Rekimoto. Therefore, it appears that claims 15 and 17 stand rejected as being unpatentable over Axberg in view of VERITAS, further in view of Chirashnya, and further in view of Rekimoto. This rejection is traversed for the following reasons. Applicants submit that the features of the present invention, as now more clearly recited in claims 15 and 17, are not taught or suggested by Axberg, VERITAS, or Chirashnya, whether taken

individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Amendments were made to the claims to more clearly describe the features of the present invention. Specifically, the claims were amended to more clearly describe that the present invention is directed to a control method of a data storage system as recited, for example, in independent claim 15.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record. More specifically, the features are not taught or suggested by Axberg, VERITAS, Chirashnya, or Rekimoto, whether taken individually or in combination with each other.

As previously discussed, Axberg discloses a method for producing a coherent view of a storage network by a storage network manager using data storage device configuration information obtained from data storage devices. However, there is no teaching or suggestion in Axberg of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

The method of the present invention, as recited in claim 15, includes a step of inputting to the management server a file type and time that the multiple computers use. The Examiner concedes that Axberg does not disclose inputting to the management server a file type and time that the multiple computers use. Applicants agree that Axberg does not disclose this feature.

The present invention, as recited in claim 15, also includes a step of retrieving data in which a modification history of the data storage system is accumulated, and displaying modified contents of the data storage system related to a physical storage position of a logical unit before said time. The Examiner concedes that Axberg does not disclose retrieving a modification history and displaying the modified contents related to a physical storage potion of a logical unit before said time. Applicants agree that Axberg does not disclose this feature.

Another feature of the present invention, as recited in claim 15, includes a step of retrieving a performance history of a logical unit and displaying a performance of a logical volume after the time. Axberg does not disclose this feature. The Examiner asserts that Axberg discloses the retrieval of event logs, which contain error messages, and concludes that this indicates how well the file system functions without error, based on time. However, this is not the same as the claimed feature of retrieving a performance history of a logical unit and displaying a performance of a logical volume after the time, as recited in claim 15.

Yet another feature of the present invention, as recited in claim 15, includes a step of displaying or posting the modified contents of the system when the performance of the logical volume is degraded. The Examiner concedes that Axberg does not disclose displaying or posting the modified contents of the system when the performance of the logical volume is degraded. Applicants agree that Axberg does not disclose this feature.

Therefore, Axberg does not disclose "inputting a file type and time that said multiple computers use, to said management server" as recited in claim 15.

Furthermore, Axberg does not disclose "retrieving data in which a modification history of said data storage system is accumulated, and displaying modified contents of said data storage system related to said storage position before said time" as recited in claim 15.

Even further, Axberg does not disclose "retrieving data in which a performance history of a logical unit is accumulated, and displaying a performance of a logical volume after said time" as recited in claim 15.

Still even further, Axberg does not disclose "displaying or posting said modified contents of said system when the performance of said logical volume is degraded" as recited in claim 15.

The above noted deficiencies of Axberg are not supplied by any of the other references of record, particularly VERITAS. Therefore, combining the teachings of VERITAS with Axberg still fails to teach or suggest the features of the present invention, as now more clearly recited in the claims.

As previously discussed, VERITAS discloses the use of a volume manager graphical user interface (GUI), a storage administrator, and a system administrator manager. However, there is no teaching or suggestion in VERITAS of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

The method of the present invention, as recited in claim 15, includes a step of inputting to the management server a file type and time that the multiple computers use. The Examiner concedes that Axberg does not disclose this feature, but asserts that VERITAS discloses showing information including a file type. However, showing

information including a file type is quite different from inputting to the management server a file type and time that multiple computers use, as claimed. Therefore, VERITAS does not disclose the claimed feature.

The present invention, as recited in claim 15, also includes a step of retrieving data in which a modification history of the data storage system is accumulated, and displaying modified contents of the data storage system related to a physical storage position of a logical unit before said time. As conceded by the Examiner, VERITAS does not disclose this feature.

Another feature of the present invention, as recited in claim 15, includes a step of retrieving a performance history of a logical unit and displaying a performance of a logical volume after the time. As conceded by the Examiner, VERITAS does not disclose this feature.

Yet another feature of the present invention, as recited in claim 15, includes a step of displaying or posting the modified contents of the system when the performance of the logical volume is degraded. As conceded by the Examiner, VERITAS does not disclose this feature.

Therefore, VERITAS does not disclose "inputting a file type and time that said multiple computers use, to said management server" as recited in claim 15.

Furthermore, VERITAS does not disclose "retrieving data in which a modification history of said data storage system is accumulated, and displaying modified contents of said data storage system related to said storage position before said time" as recited in claim 15.

Even further, VERITAS does not disclose "retrieving data in which a performance history of a logical unit is accumulated, and displaying a performance of a logical volume after said time" as recited in claim 15.

Still even further, VERITAS does not disclose "displaying or posting said modified contents of said system when the performance of said logical volume is degraded" as recited in claim 15.

The above noted deficiencies of Axberg in view of VERITAS are not supplied by any of the other references, particularly Chirashnya. Therefore, combining the teachings of Chirashnya with Axberg and VERITAS still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Chirashnya discloses a method for diagnosing faults in a computer-based system by use of a table-based error log analysis. However, there is no teaching or suggestion in Chirashnya of a data storage system and control method of a data storage system of the present invention, as recited in the claims.

In Chirashnya, a method for diagnosing faults in a computer system is provided. A log of errors of different kinds that have been recorded in the system is read, and errors of the kind that are relevant to one or more predetermined types of faults that can occur in the system are selected from the log. The selected errors are filtered to compose one or more events, each even including one or more occurrences of one or more of the relevant kinds of errors. The composed events are analyzed to reach an assessment that at least one of the predetermined types of faults has occurred.

The method of the present invention, as recited in claim 15, includes a step of inputting to the management server a file type and time that the multiple computers use. Chirashnya does not disclose this feature.

The present invention, as recited in claim 15, also includes a step of retrieving data in which a modification history of the data storage system is accumulated, and displaying modified contents of the data storage system related to a physical storage position of a logical unit before said time. Chirashnya does not disclose this feature.

Another feature of the present invention, as recited in claim 15, includes a step of retrieving a performance history of a logical unit and displaying a performance of a logical volume after the time. Chirashnya does not disclose this feature. The Examiner asserts that Chirashnya shows errors pertaining to file-system full error. However, this feature is quite different from retrieving a performance history of a logical unit and displaying a performance of a logical volume after the time, as claimed.

Yet another feature of the present invention, as recited in claim 15, includes a step of displaying or posting the modified contents of the system when the performance of the logical volume is degraded. Chirashnya does not disclose this feature. The Examiner asserts that Chirashnya shows that an error message is given when a file cannot grow larger. However, this is not the same as displaying a posting the modified contents of the system when the performance of the logical volume is degraded, as recited in claim 15.

Therefore, Chirashnya does not disclose "inputting a file type and time that said multiple computers use, to said management server" as recited in claim 15.

Furthermore, Chirashnya does not disclose "retrieving data in which a modification history of said data storage system is accumulated, and displaying modified contents of said data storage system related to said storage position before said time" as recited in claim 15.

Even further, Chirashnya does not disclose "retrieving data in which a performance history of a logical unit is accumulated, and displaying a performance of a logical volume after said time" as recited in claim 15.

Still even further, Chirashnya does not disclose "displaying or posting said modified contents of said system when the performance of said logical volume is degraded" as recited in claim 15.

The above noted deficiencies of Axberg in view of VERITAS, further in view of Chirashnya, are not supplied by any of the other references, particularly Rekimoto. Therefore, combining the teachings of Rekimoto with Axberg, VERITAS and Chiashnya still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Rekimoto teaches an access-history indicating method for sequentially recording a history of access by a user to a resource object such as a file or a WWW page. However, there is not teaching or suggestion in Rekimoto of a control method of a data storage system as recited in the claims.

The Rekimoto method sequentially records a history of access by a user to a resource object such as a file or a WWW page. In the method, an access history icon that visually represents access-history information is generated an is displayed in the vicinity of the corresponding icon on a desktop screen or in the vicinity of an

anchor of a WWW page. The access history icon has an image in which events of accessing the corresponding resource object are displayed on a time basis. The image may be displayed by separating the type of access into modification and reference. The user can obtain a visual and intuitive understanding about a history of access to each file and a history of updating each file. The obtained information can be used as an important key for selecting files and WWW pages.

The method of the present invention, as recited in claim 15, includes a step of inputting to the management server a file type and time that the multiple computers use. Rekimoto does not disclose this feature. The Examiner asserts that Rekimoto disclose access history, including the time of access. However, this is not the same as inputting to the management server a file type and time that multiple computers use, as claimed.

The present invention, as recited in claim 15, also includes a step of retrieving data in which a modification history of the data storage system is accumulated, and displaying modified contents of the data storage system related to a physical storage position of a logical unit before said time. Rekimoto does not disclose this feature. To support the assertion that Rekimoto discloses this feature, the Examiner refers to Fig. 1, which shows a modification history, and Fig. 5, which shows the display of modified contents. However, the cited drawings and the associated text do not disclose retrieving data modification history and displaying the modified contents of a data storage system related to a physical storage position of a logical unit before said time, in the manner claimed.

Another feature of the present invention, as recited in claim 15, includes a step of retrieving a performance history of a logical unit and displaying a performance of a logical volume after the time. Rekimoto does not disclose this feature.

Yet another feature of the present invention, as recited in claim 15, includes a step of displaying or posting the modified contents of the system when the performance of the logical volume is degraded. Rekimoto does not disclose this feature. The Examiner asserts that Rekimoto displaying or posting the modified contents of the system based on time. However, the Examiner concedes that Rekimoto does not disclose performing the step of displaying or posting when the performance of the logical volume is degraded. Applicants submit that Rekimoto doe not disclose the claimed feature, and contrary to the Examiner's assertions, combining Rekimoto with Chirashnya would not result in displaying or posting the modified contents of the system when the performance of the logical volume is degraded.

Therefore, Rekimoto does not disclose "inputting a file type and time that said multiple computers use, to said management server" as recited in claim 15.

Furthermore, Rekimoto does not disclose "retrieving data in which a modification history of said data storage system is accumulated, and displaying modified contents of said data storage system related to said storage position before said time" as recited in claim 15.

Even further, Rekimoto does not disclose "retrieving data in which a performance history of a logical unit is accumulated, and displaying a performance of a logical volume after said time" as recited in claim 15.

Still even further, Rekimoto does not disclose "displaying or posting said modified contents of said system when the performance of said logical volume is degraded" as recited in claim 15.

Applicants submit that claim 17 is dependent on claim 16. Therefore, claim 16 is patentable for at least the reasons discussed previously regarding independent claim 16.

Axberg, VERITAS, Chirashnya, and Rekimoto each suffer from the same deficiencies relative to the features of the present invention as recited in the claims. Therefore, combining the teachings of Axberg, VERITA, Chirashnya, and Rekimoto in the manner suggested by the Examiner does not render obvious the features of the present invention as now more clearly recited in claims 15 and 17. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 15 and 17 are respectfully requested.

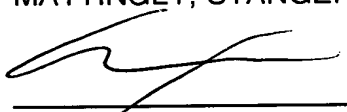
The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references used in the rejection of claims 1-24.

In view of the foregoing amendments and remarks, Applicants submit that claims 1-24 are in condition for allowance. Accordingly, early allowance of such claims is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger & Malur, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 520.41229X00).

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.



Carl I. Brundidge
Registration No. 29,621

CIB/DKM/sdb
(703) 684-1120